App. F. IX-4

Previous References

1939.
(9H.)

File No. 129-39

Serial Nos. 1-3

Later References.

P

25

GENERAL AND REVENUE SECRETARIAT.

Serial Nos. Three

Part B for January 1940.

SUBJECT.

Scheme for manufacture of Potassium Salts from Molasses

Dr A. V. Varadarajan may be given the necessary facilities & try his process on a factory scale

WD 0573—GPB—22,500—12-9-39

8/2

Serial No.

GEN & REVENUE SECRETARIAT. 18 DEC 19 DEVELOPMENT BRANCH.

As directed by the Member I discussed with Mr.Varadaraja Iyengar the process for the recovery of potassium compounds from molasses.

Molasses contains ~~uncovering~~ sucrose and potash. While sucrose is now being utilised in the distillery for the manufacture of alcohol, Potash is going to waste, though it is a very useful material as a fertiliser. Potassium can be recovered from molasses in the form of cream of tartar by the addition of tartaric acid, while the addition of pure tartaric acid ~~as such~~ to molasses would be very costly, Mr.Varadaraja Iyengar proposes to use the tartaric acid contained in green tamarind. The flow-sheet in the file graphically describes the process.

Mr.Sastry condemns the process on the ground that though successful on a laboratory scale it may not be a success on an industrial scale. It is just this factory scale experience that Mr.Varadaraja Iyengar desires to have and has been requesting the Sugar Company to afford. As explained in the letter to the Chairman of the Sugar Company by the Prof: of Bio-Chemistry " In order to utilise his laboratory processes in a better and practical way, he is anxious to familiarise himself with the processes and the conditions occuring/in a Factory ~~and them under large scale conditions~~ so that he may be in a position to develop his laboratory results. He wants to find from actual laboratory practice what will be the suitable stage when the tartaric acid can be added to remove potash

NOTE—Contn. Sheet

from molasses. The main object in working in a factory would be to test the juice, syrup and centrifugal - effluents and examine them for their suitability for potash extraction by his patented process. He will study the samples, examine its potash content, the time occupied for complete precipitation of potash salts and other economical aspects of the question as occur in actual factory conditions".

The factory was not however in a position to give him the necessary facilities, as the management did not intend giving training to any man whom it was not their intention to absorb in the factory. The matter may perhaps be reconsidered by the Chairman as it would be worthwhile giving a trial to the process.

As to the second point raised by Mr. Sastry, that in a poor country like India such a valuable foodstuff as tamarind should not be diverted to industrial use, it will be seen from the flowsheet that it is only in the first instance that tamarind will be used for getting "extract containing tartaric acid." This tartaric acid will be recovered and used over and over again for use with fresh molasses after the manufacture of potassium salts are obtained. There will certainly be a certain percentage of waste in the process, but the quantity of tamarind required at later stages will be a very small fraction of the tamarind required initially.

For the initial stage, however, if any thing like 20 tons of molasses has to be treated per day, the quantity of tamarind required will be very considerable, probably the yield of 6,000 trees. Such a large number may or may not be available round about Mandya; but even if tamarind has to be got from a distance, the

Manufacture of potassium compounds from molasses. 102 3

Serial No.

transport charges may not be heavy, as the tamarind may be pulped and pressed out in the village itself and "the extract of ~~tamarind~~ tartaric acid" obtained at the factory for being mixed with molasses. The whole process seems to deserve a trial.

Mr.Varadaraja Iyengar has not calculated from the business point of view the quantities and the value of the potassium chloride, potassium sulphate, Caustic potash, Potassium ~~c/~~ acetate, Rochelle salt, tartar emetic and other chemicals that may be produced from a given quantity of molasses and tamarind and what the margin of profit would be. He will perhaps be in a position to do so only after he has tried his process on a factory scale.

Mr. Sastry has raised another point viz., that the potash salts may be recovered after the recovery of alcohol from the molasses. Mr.Varadaraja Iyengar explains that it would be much easier to recover it from the ~~same~~ semi-solid molasses, as the quantity to be dealt with will be much smaller, than from the effluent from the distillery in a much diluted form.

The Chairman of the Sugar Company may there fore be requested to give Mr.Varadaraja Iyengar the necessary facilities, as the Sugar Company may, even be able to recover certain valuable products from molasses in addition to the alcohol that they are now recovering. ~~as~~ The process of the manufacture of potassium salts does not in any way interfere with the quantity or quality of the alcohol that may be recovered from the molasses.

FIRST MEMBER

16/12/39

20/12/39

21.12.39

OFFICE OF THE FIRST MEMBER OF COUNCIL
DEC 19 1939
No. 5867

Manufacture of Potassium compounds from molasses. 1

re File No. of 193 | General and Revenue Secretariat.

Serial No.

Draft D.O to the Chairman mgs. Sugar Co. Mdu

Mdu 27/12 For favour of perusal b/fr the

Deputy) 27/12/39

27/12

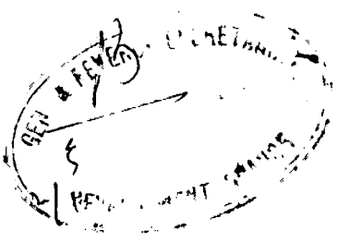
22/12

To. The Chairman.

Mysore Sugar Co Ltd. Bangalore 3

D 3220. 29-12-39

Request him to give Dr. A.N Varadaraja Iyengar necessary facilities to try his Processon a factory Scale



5

THE MYSORE SUGAR COMPANY, LTD.

RAJAMANTRAPRAVINA DIWAN BAHADUR
K. MATTHAN
CHAIRMAN

"SANTHI BHAVAN"
SESHADRI ROAD
BANGALORE

5th August 1939

C-19/362

Dear Mr. Madhava Rau,

You may remember my mentioning to you that a research worker in the Indian Institute of Science (Dr. A. V. Varadaraja Iyengar) has put forward a scheme for the extraction of potash from the Molasses produced in the Mandya Sugar Factory using in lieu of tartaric acid, tamarind fruit to be obtained locally. The scheme is based purely on the results of laboratory work and is not matured enough to be tried on a factory or even a semi-factory scale. It has appeared to me that this is a matter which may be of interest to the Board of Industries. I am sending herewith the papers received from Dr. Varadaraja Iyengar for your perusal.

In case you are interested, I can ask Dr. Varadaraja Iyengar to see you and explain his scheme.

Yours sincerely,

Matthan

Rajamantrapravina
N. Madhava Rau, B.A.,B.L.,
Member of Council,
BANGALORE.

ENC. 1 File.

TRR.

Ftc 129-39-1

6

Tel. Address : "SANDAL" MYSORE.
Telephone No. 362.

GOVERNMENT OF MYSORE.

Mr. S. G. SASTRY, B.A., M.Sc. (Lond.),
Director.

GEN & REVENUE SECRETARIAT. 1022 26 AUG. DEVELOPMENT BRANCH.

No. 24/39-40
Encl. 1 Booklet & 3 papers

Office of the Director,
Sandalwood Oil Factory, Mysore.

Dated 21st August *1939.*

Dear Sir,

Reference: Your D.O. Letter No. 12 dated 7th August 1939.

Subject: Recovery of Potassium Compounds from Molasses as proposed by Mr. Varadaraja-Iyengar.

I have carefully gone through the processes described. They will be alright in a laboratory with a few grams of substances. On an industrial scale the process seems hopeless from the point of view of ultimate recovery of potassium salts. In a laboratory no "value" is attached or credit given for (a) Dissolving and Diluting, (b) Leaching, (c) Heating, (e) Concentrating and evaporating, (f) Drying etc. All these require investment on apparatus and every operation mentioned above means money. I do not think that Mr. Varadaraja Iyengar has any notion of the Chemical ENgineering aspects of his proposals. I would not waste any money in giving a large scale trial for the process unless radically modified.

By the process advocated, I do not think that Mr. Varadaraja Iyengar can get pottassium Chloride and Potassium Sulphate anywhere as cheap as the imported German stuff.

I am also of opinion that in a poor country like India, such a valuable foodstuff as Tamarind should not be diverted for industrial uses. It is only when we have enough Tamarind to eat and spare, the idea of getting Tartaric Acid from Tamarind should be encouraged.

Another point of view. In U.S.A. and other countries

they prepare valuable Syrups (like Golden Syrup) and imitation honey etc., from Molasses. I wish one of our enthusiastic Chemists would wokk from this end. I think there is money in it. Mr. Varadaraja Iyengar has got the wrong end of the stick.

If, Mr. Varadaraja Iyengar is particularly intent on the recovering Potassium Compounds from Molasses there is another obvious source. After the Molasses have been fermented, the effluent from the distillery and also the solid refuse from the distilliry will contain all the potassium originally contained in the Molasses. We shall have recovered all Sugar in the form of Alcohol---and Mr. Varadaraja Iyengar may get the Potash Salts afterwards.

I return herewith the papers of Mr. Varadaraja Iyengar.

With regards
Yours sincerely
M. Visvesvaraya

Rajamantrapravina
N. Madhava Rao Esq., B.A., B.L.,
First Member of Council,
General and Revenue Secretariat,
Bangalore.

BVR.

Appendix F G—1]

SUBJECT.....

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Section 9c

File No. 129-39

Serial No. 2

Diary No. of letter replied to .....

No. D 1198

To

Dr. A. V. Varadaraja Iyengar,
B.A., D.Sc., A.I.C.
Bio-Chemist,
Indian Institute of Science,
Bangalore.

General and Revenue Secretariat

( )

the *193* .

Date of issue 26/8/37

Signed by Mr Georgemathan

Dear Sir,

I am desired to request you to kindly make it convenient to meet Mr. A. N. Krishna Rao, Secy. to Govt. Dev. Dept. in his office during working hours on Wednesday 30th instant to discuss your proposal about extraction of potassium from molasses.

List of enclosures.....

Copied by .....

Examined by.....

WD 0278—GPB—30,000—4-3-38

26/8

mainly as the lime tartrate in a quantitative manner. This lime salt forms in its turn a source for the liberation of fresh tartaric acid by being treated with sulphuric acid. The other chemicals required in this connection are either pure limestone, marble or calcium carbonate, and some salts of calcium such as calcium chloride and calcium sulphate, the latter of which may arise from the lime tartrate when treated with sulphuric acid.

(ii) The utilisation of the residual tamarind pulp is under investigation, but can best be utilised as cattlefeed mixed with treated molasses.

****

A. V. VARADARAJA IYENGAR, B.A., D.Sc., A.I.C.
BIOCHEMIST

Indian Institute of Science,
Bangalore.

DEC 21 1939
No 6027

Ref: M.233.

Date 20th Dec.1939.

P.H. ~~Krishna Rao, Esq.~~, M.,
Secretary to Government,
Development Department,
Revenue Secretariat,
BANGALORE.

GENERAL SECRETARIAT. 26 DEC. DEVELOPMENT BRANCH.

2463

The file has been submitted separately

21.12.39

(Member)

23/12/39

26/12

Daer Mr.Krishna Rao,

In connection with the working up of the extraction of potash from molasses through the addition of tartaric acid or crude tamarind extract, you wanted me to let you have an idea of the equipment that may be necessary for operating this process. As you are fully aware, it is rather difficult for me to envisage now the full equipment for the purpose. I have been making some drawings in that connection and hope to complete the same in the next few days. As the Xmas Holidays have intervened, I shall only be able to let the Government have the blue print early next year.

In the meantime, it may be of help to you to have an idea of the desirable equipment. The dilution of molasses, the treatment with tamarind extract and the residual liquid with chalk will have to be effected in masonry tanks to be locally made. The filtration (removal of the solid from the liquid) may be carried out either in a filterpress or in a centrifuge, both of which will be available in a sugar factory. The final molasses can be pumped to the fermentation vats. A few pumps will be required for all the operations.

The cream of tartar separating from the molasses is purified by washing either in a filterpress or in a centrifuge and transferred to a wooden vat provided with agitating equipment and steam coil and treated

A. V. VARADARAJA IYENGAR, B.A., D.Sc., A.I.C.
BIOCHEMIST.

17

Ref:

Date 20th Dec. 1939.

with chalik and gypsum or ckalk and calciu chloride. The entire mass is then filterpressed or centrifuged. The aquepous portion is evaporated in an evaporator, the cost of which depends upon ~~the~~ its capacity. The lime tartrate from this and from molasses treatment is mixed and treated in a leadlined wooden vat provided with stirrer with sulphuric acid. The sludge is filterpressed, and the liquid containing tartaric acid only is pumped to an acid resisting container for being added to molasses afresh. The calcium sulphate can be dried and used again, for producing potasssium sulphate.

You will thus see that most of the equipment is to be locally made. Filter presses are not difficult to obtain or to make; centrifuges are to be had cheaper. These are already available in the Sugar factory. The equipment for the entire process including an evaporator may not be more than 35,000 Rs. Where the tamarind extract also is to be produced in the initial stages, the above can be made use of and an additional provision made to the value of 15,000 Rs. These figures may be found to be rather high. I hope I have provided you with sufficient data. I may add here that this outlime may require modifications when examined in greater detail, for which I am sure the factory is fully equipped with Technologists. I shall appreciate your kindness for your early recommendation on this proposal.

Thanking you in anticipation,

Yours sincerely,

A. Varadaraja Iyengar

Appendix F G—1]

18

SUBJECT.....

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Section D.C/29

File No. 259-39

Serial No. 3

Diary No. of letter replied to .....

No. D 3220

To

Dear Sir

Scheme for manufacture of Potassium salts from Molasses.

General and Revenue Secretariat

( )

the *193* .

Date of issue 29/12/39

Signed by Mr. P.B. Krishna Rao

I am with reference to your D.O. letter No. C-19/36-2 dated 5-8-1939 addressed to the Fisheries Member of Council on the above subject, directed to request that Dr. D. Venkata Raja Iyengar may be permitted to ~~Got. consider~~ examine necessary facilities by his process on a factory scale and calculate from the business point of view the quantities and the value of the Potassium chloride and other chemicals that may be produced from a given quantity of molasses and find out the tonnage and what would be margin of profit would be. I am accordingly to request that you will be kindly arrange to give necessary facilities to Mr. Venkata Raja Iyengar.

I am to add that it is expected that by these experiments

List of enclosures.....

Copied by.....

Examined by.....

the Ingersoll are be able to recover certain valuable products from molasses in addition to the alcohol that they are now receiving. The process does not in any way interfere with the quantity or quality of the alcohol that may be recovered from the molasses.

Yours sincerely

22/12

Dr

The Chairman
Ingersoll Engg Co Ltd
Bangalore

ks
22/12

D.O. No. D 3220
Re 129-39-3

GENERAL AND REVENUE SECRETARIAT.

Dated, Bangalore, 27th Decr. 1939.

29

Dear Sir,

Subject:- Scheme for manufacture of Potassium Salts from Molasses.

With reference to your D.O.letter No.C.19/362 dated 5th August 1939, addressed to the First Member of Council on the above subject, I am desired to request that Dr.A.V. Varadaraja Iyengar may be given the necessary facilities to try his process on a Factory Scale and calculate from the business point of view the quantities and the value of the Potassium chloride, and other chemicals that may be produced from a given quantity of molasses and tamarind and find out what the margin of profit would be.

Yours sincerely,

28/12

Rajamantrapravina Diwan Bahadur
K.Matthan, Esq., B.A.,
Chairman, The Mysore Sugar Company, Ltd.,
Santhi Bhavan, Seshadri Road, BANGALORE.

K.M.R.2.

21

TELEPHONE No. 2133

FACTORY:
MANDYA (MYSORE STATE)

THE MYSORE SUGAR COMPANY, LTD.

TEL. ADD.:
"MYSUGAR"
CODES USED:
A.B.C. 5TH EDN. & BENTLEY'S

"SANTHI BHAVAN"
SESHADRI ROAD

REF. NO. C-19/6456

BANGALORE, 2nd January 1940.

SECY. DEV. DEPT. 3 JAN 1940 GOVT. MYSORE

GEN. & REVENUE SECRETARIAT 4 JAN DEVELOPMENT

2534

The Secretary to Government,
Development Department,
Bangalore.

Dear Sir,

Re. Scheme for manufacture of Potassium Salts from Molasses.

With reference to your D.O. Letter No. D-3220 dated 29th December 1939, addressed to our Chairman, in the matter of facilities to be given to Dr. Varadaraja Iyengar to try his process on a Factory scale, we shall be obliged if you will return to us the papers submitted by Dr. Varadaraja Iyengar, which were forwarded to the First Member along with our Chairman's D.O. Letter No. C-19/1362 dated 5th August 1939.

Yours faithfully,
THE MYSORE SUGAR CO. LTD.

W. N. Pallegar

SECRETARY

Dft returning (note).
Kil 4/1/40
GHK. 4/1/40

Issued 8-1-40

D 3339.

6 JAN 1940 GEN. & REVENUE SECTT.

GOVERNMENT OF HIS HIGHNESS THE MAHARAJA OF MYSORE

22

General and Revenue Secretariat

No. D 3339 Encs 18.2 *Dated, Bangalore,* 8th January 1940

From

The Secretary to the Government of His Highness the Maharaja of Mysore,
Development Department.

To

The Secretary,
Mysore Sugar Company Ltd.,
Bangalore.

Sir,

As desired in your letter No.C-19/6456 dated 2nd January 1940, I am directed to return herewith the papers etc, submitted by Dr. Varadaraja Iyengar, on the manufacture of Potassium salts from molasses.

I have the honour to be,
Sir,
Your most obedient servant,

For Secretary to Government,
Development Department.

MK.

Appendix F G—1]

SUBJECT.....

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Section

File No.

Serial No.

No. D 3339

Diary No. of letter replied to .....

To

The Secy. Mysore Sugar Co Ltd
Bangalore

General and Revenue Secretariat

( )

the *193* .

Sir

I am directed to refer to your letter No. C-19/6465 dated 2-1-1940, and am directed to return herewith the papers submitted by Mr. Varadaraja Iyengar, on the manufacture of Potassium salts from molasses.

I have etc.

for Secretary

Date of issue 8/1/40

Signed by Mr George mathew

Ks
4/1/40

List of enclosures.....

Copied by.....

Examined by.....